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PATENT
Attorney Docket No.: SP02-212

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Berkey, George E et al.	
Serial No:	10/663475	Examiner: Hoffman, John M
Filing Date:	09/15/2003	Group Art Unit: 1731
Title:	Method for Treating an Optical Fiber Preform with Deuterium	

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BRIEF ON APPEAL

This Brief supports the appeal to the Board of Patent Appeals and Interferences from the final rejection dated March 20, 2007, in the application listed above. Appellant filed the Notice of Appeal on June 6, 2007. Appellant now submits this Brief as required by 37 C.F.R. § 41.37.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Corning Incorporated.

II. RELATED APPEALS AND INTERFERENCES

With respect to the related appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal, there are no such appeals or interferences.

III. STATUS OF CLAIMS

On June 6, 2007 appellant appealed from the final rejections of claims 1-14 and 16-19 which were rejected in the final Office Action dated March 20, 2007. Those are the pending claims that are the subject of this Appeal and are set forth in the attached Appendix.

IV. STATUS OF AMENDMENTS

There were no amendments filed subsequent to the final rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 relates to a method of forming an optical fiber perform that provides a consolidated glass preform precursor body having an outer surface; deposits a layer of silica soot 132 onto the outer surface 112 of the consolidated glass perform precursor body 100 to form a composite perform 130 comprised of a consolidated glass portion 10, 100 and a silica soot portion 132; and in a deuterium-exposing step, exposes the composite perform 130 to an atmosphere containing a concentration of D_2 or D_2O or a mixture of D_2 or D_2O for a time and at a temperature sufficient to cause the D_2 or D_2O to penetrate the consolidated glass portion without entirely pervading the consolidated glass portion. (see for example, page 1, lines 13-20, Figs 8 and 9, and page 12, line 15-page 13, line3).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The claims are currently rejected by the Patent Office as follows:

1) Claims 1-14 and 16-19 are rejected under 35 U.S.C §103(a) as being unpatentable over Gilliland (U.S. 4,810,276) in view of Burrus et al (U.S. 4,515,612).

2) Claims 4-11 and 16 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

VII. ARGUMENT

The rejection of Claims 1-14 and 16-19 under 35 U.S.C §103(a) as being unpatentable over Gilliland (U.S. 4,810,276) in view of Burrus et al (U.S. 4,515,612) is improper.

According to the Examiner:

> "Gilliland discloses the steps of providing a consolidated glass rod (feature 54, figure 4) and depositing a layer of silica soot (68) on the outer surface.....Gilliland does not teach exposing the composite preform to an atmosphere containing deuterium."
>
> "Burrus teaches exposing preforms to deuterium to lower fiber loss: (col 2, lines 19-26). This treatment can be applied to composite preforms: (col. 4, line 61 – col. 5, line 2.) The treatment can be applied at any time (col. 6, lines 34-37) including after each layer is made (col. 5, lines 55-61). Col. 5, lines 7-16 indicates that treatment can be done prior to consolidation – and that such is "typically quite short". It would have been obvious to treat with deuterium after each layer is deposited in the Gilliland/OVD method to lower fiber loss to the maximum extent."

Applicants submit that there would be no motivation to combine the references in the manner proposed by the Patent Office, and even if there was motivation to do so, such a combination would not result in applicants' claimed invention.

The Examiner mischaracterizes several of the passages in Burrus. In an attempt to bring one of these mischaracterizations to the attention of the Examiner, applicants in the response dated January 23, 2007, indicated that applicants disagreed with the Examiner's comments and explained that col. 6 lines 34-37 did not state that "the treatment can be applied at any time." On page 5 of the Final Rejection, the Examiner responded that his rejection did not indicate that Burrus "states" this, that instead this was a reasonable conclusion based on what Burrus does "state". The Examiner then surprisingly indicated that he presumes applicants agree that such is a reasonable summary of Burrus (applicants clearly do not agree), in spite of the fact that this in response to applicants' explanation that they do not agree that Burrus states what the Examiner had indicated. For the record, applicants do not agree with any of the Examiner's statements unless expressly indicated.

Applicants assume that the additional characterizations by the Examiner of what Burrus teaches are, like col. 6 lines 34-37, conclusions of the Examiner based on what the

Examiner believes Burrus states. Applicants assume this because, like the passage at col. 6, lines 34-37, the conclusions do not seem to agree with the actual words found in each of the passages referred to. The Examiner provides no rationale or discussion as to how his conclusions are reached for each passage. Consequently, applicants are compelled to point out how the Examiner's conclusions do not appear to be supported by the passages referred to. Applicants therefore disagree with what are apparently the Examiners conclusions as to what the following passages in Burrus state:

(1) According to the Examiner:

"Burrus teaches exposing preforms to deuterium to lower fiber loss: (col 2, lines 19-26). This treatment can be applied to composite preforms: (col. 4, line 61 – col. 5, line 2.)"

Applicants disagree that column 4, line 61 – column 5, line 2 indicate that "This treatment can be applied to composite preforms." Column 4, line 61 – column 5, line 2 states that:

> "Preforms thus can consist either completely of "deposited" glass (i.e., glass formed during perform manufacture by a glass-forming chemical reaction such as the above described gas-phase reaction), of deposited glass in addition to "undeposited" glass (i.e., glass derived from a glass body not formed during perform manufacture by a glass-forming reaction, such as fused quartz from a pre-existing fused quartz substrate tube), or even completely of undeposited glass."

Note that this passage does not mention treatments at all, of any kind. This passage merely indicates that performs may consist of either completely deposited glass or deposited glass and undeposited glass. More importantly, this passage does not refer to all perform manufacturing operations in general, as the Examiner's overly broad and unnatural reading would imply. Rather, this passage refers only to VAD and MCVD performs which are expressly referred to in the passage immediately preceeding (Col. 4, lines 56-61). VAD and MCVD are notably not processes which involve depositing a layer of silica soot onto the outer surface of the consolidated glass preform precursor body to form a composite preform comprised of a consolidated glass portion and a silica soot portion, as required by claim 1.

(2) According to the Examiner, the treatment can be applied at any time (col. 6, lines

34-37) including after each layer is made (col. 5, lines 55-61).

Applicants disagree that column 6, lines 34-37 indicate that the treatment can be applied at any time. Column 6, lines 34-37 state that:

> "Deuteration of the silica can of course take place at any appropriate stage of the article manufacturing process, for instance, after forming of the tube or rod." (emphasis added)

Rather than indicating that deuteration can be applied at any time, this passage indicates that deuteration can occur at appropriate stages. The only examples of appropriate stages given by Burrus are (1) after forming a tube or (2) after forming a rod. This passage thus describes applying the deuterium to consolidated rods and tubes. It does not disclose or suggest applicants' claimed process, nor does it suggest broadly that "the treatment can be applied at any time" .

(3) According to the Examiner, the treatment can be applied at any time (col. 6 lines 34-37) including after each layer is made (col. 5, lines 55-61).

Applicants disagree with the Examiner's statement that Column 5, lines 55-61 suggests that a treatment can be applied after each OVD layer is made. Column 5, lines 55-61 indicate that:

> "Since in the MCVD process consolidation of any individually deposited layer generally takes place before deposition of the succeeding layer it is, of course, possible to carry out the D/H exchange layer by layer." (emphasis added)

This passage suggests that only in processes such as MCVD, where consolidation of any individually deposited layer generally takes place before deposition of the succeeding layer, can layer by layer D/H exchange occur. This passage thus teaches away from the modification proposed by the Examiner, namely, "it would have been obvious to treat with deuterium after each later is deposited in the Gilliland/OVD method to lower fiber loss to the maximum extent". This passage in fact indicates that only in processes such as MCVD methods, where consolidation of any individually deposited layer generally takes place before deposition of the succeeding layer, can layer by layer D/H exchange occur.

(4) According to the Examiner, Col. 5, lines 7-16 indicates that treatment can be done prior to consolidation – and that such is "typically quite short". It would have been obvious

to treat with deuterium after each layer is deposited in the Gilliland/OVD method to lower fiber loss to the maximum extent."

Applicants disagree. Column 5, lines 7-16 provides that:

> "If at some point of the preform manufacturing process the complete unconsolidated deposit is available for processing, then our invention can be practiced by exposing the unconsolidated deposit to an atmosphere containing deuterium for a sufficient length of time to prevent diffusion of the deuterium throughout the volumes of interest. Since in this case these volumes are essentially those of the individual deposited particles, this time will be typically quite short at elevated temperatures."

This passage is referring to the passage immediately preceeding (Col. 5, lines 2-6) which again refers only to the VAD and MCVD processes. Neither VAD nor MCVD are relevant to the currently pending claim 1 which involves OVD soot deposition, as neither of these processes would result in unconsolidated glass deposited onto the outer surface of a consolidated glass precursor body. Furthermore, this passage teaches that in instances where soot is present, the deuterium treatment should be applied only to those individual particles, not penetration of the unconsolidated deposit so that the D_2 or D_2O penetrates the consolidated glass portion, as required by claim 1. Consequently, if anything, this passage clearly teaches away from the combination proposed by the Patent Office.

The fact that the Examiner in several instances mischaracterizes and/or only refers to selected portions of Burrus as support for his broad and unnatural reading of Burris, without any consideration given to the additional portions of Burrus which clearly do not support the Examiner's conclusions, illustrates that this rejection is a hindsight rejection.

Applicants also respectfully disagree with the Examiner's statement that it would have been obvious to treat with deuterium after each layer is deposited in the Gilliland/OVD method to lower fiber loss to the maximum extent. There is no mention in any of the references cited the Examiner that treatment of each layer would reduce fiber loss to the maximum extent, and the Examiner has not provided any source in support of this statement.

Furthermore, even if the references were combined in the manner suggested, doing so would not result in applicants' claimed invention which requires penetrating the consolidated glass portion without entirely pervading the consolidated glass portion. This step which is

recited in claim 1 (penetrating a consolidated glass portion without entirely pervading the consolidated glass portion) is not mentioned or suggested by any of the references cited by the Patent Office.

According to the Examiner, "As to the limitation that time and temperature being sufficient to cause the deuterium compound to penetrate without pervading. It is quite clear the compound penetrates (col 1, lines 66-68 and col. 2, line 65 to col. 3, line 3 and elsewhere in Burrus). From col. 3, lines 19-21 and elsewhere in Burrus; the compound does not pervade – it is reacted with OH." Applicants agree that deuterium penetrates, however claim 1 is not claiming mere penetration. Instead, claim 1 requires exposing a composite perform comprised of both deposited silica and consolidated glass for a time and temperature sufficient to cause the deuterium compound to penetrate the consolidated glass portion without pervading the entire glass portion. According to the Examiner, the compound does not pervade because it is reacted with OH. Applicants submit that this would only occur if all of the deuterium were reacted with OH so that none of it would continue to migrate through the glass. The Examiner has submitted no evidence in support of the statement that all of the deuterium is reacted with OH.

> In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. Ex Parte Levy, 17 USPQ2d 1461 (BPAI 1990)

Further, none of the references either alone or in combination disclose a method in which performs consisting of a partly consolidated glass and partly silica soot body is exposed to deuterium so that deuterium penetrates through the soot body and into the consolidated glass portion without entirely pervading the consolidated glass portion, as required by claim 1.

For all of the above reasons, applicants submit that the Examiner has failed to make out a prima facie case of obviousness, and that claim 1 is therefore in condition for allowance.

Claims 6 and 7

According to the Examiner with respect to claims 6 and 7:

> "Claims 2-5: see Gilliland col. 9, lines 20-27 and 48-51: for claim 7 it is deemed that one can call it a purge gas because it is used to purge water from the perform. "As to claim 6: See col. 8, line 63 of Gilliland – it is inherent that the composite perform is

contacted with chlorine compound during its production."

With respect to claim 6, applicants submit that there is no suggestion in the passage referred to that dehydration should occur prior to the deuterium exposing step, as required by claim 6. With respect to claim 7, applicants respectfully submit that the Examiner's reading of column 9, lines 20-27 and 48-51 are incorrect. Neither of these passages describe purging water from a perform, nor do these passages mention or suggest exposing the perform to a purge atmosphere comprising an inert gas prior to the deuterium exposing step, as required by claim 7. Applicants therefore submit that the Examiner has failed to make out a prima facie case of obviousness with respect to claims 6 and 7, and it is submitted that these claims are therefore in condition for allowance.

Claim 9

With respect to claims 9, the Examiner indicates "see column 5, lines 50-55 of Burrus."

Applicants have reviewed column 5, lines 50-55 of Burrus. The passage referred to does not even mention inert gas, and certainly does not mention exposing the perform to a purge gas after a deuterium exposing step. Applicants submit that the Examiner has not made a prima facie case of obviousness, and that claims 9 is in condition for allowance.

Claim 11

With respect to claim 11, the Examiner indicates that:

> "Examiner takes Official Notice that is well-known to use an inert purge gas in the fiber making art between steps, so as to remove left-over species from the previous step. It would have been obvious to purge the Burrus/Gilliland gases between steps, so as to prevent unintended consequences from the prior gases."

According to the MPEP, Official notice without documentary evidence to support an examiner's conclusion is permissible only in some circumstances. While "official notice" may be relied on, these circumstances should be rare when an application is under final rejection or action under 37 CFR 1.113. Official notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known. As noted by the court in *In re Ahlert*, 424 F.2d 1088, 1091, 165 USPQ 418, 420 (CCPA 1970), the notice of facts beyond the record which may be taken by the examiner must be "capable of such instant and unquestionable demonstration as to defy

dispute" (citing *In re Knapp Monarch Co.*, 296 F.2d 230, 132 USPQ 6 (CCPA 1961)). MPEP 2144.03

Applicants submit that, while the MPEP indicates that Official Notice should be rare when an application is under Final Rejection, the Examiner in the current Final Rejection uses Official Notice for three of the 18 currently pending claims, namely 11, 13, and 14. With respect to the Official Notice used in claim 11, Applicants submit that it is not particularly common to use an inert purge gas in fiber making manufacturing operations between steps, and applicants wonder why the Examiner might instead have supplied a reference in support of his Official Notice if indeed it was so well known to do so. In many fiber manufacturing processes, there is no need to utilize a purge gas between steps. Applicants further submit that it is not well known to utilize a purge atmosphere after a deuterium-exposing step such as is defined by claims 11, and the Examiner has offered no teaching from the prior art to do so. Furthermore, claim 11 requires more than "an inert gas in the fiber making art between steps", as proposed by the Examiner. In particular, claim 11 requires a subsequent step of exposing to a dehydration atmosphere. Consequently, applicants submit that the Examiner has not made a prima facie case of obviousness, and that claim 11 is in condition for allowance.

Claim 12

According to the Examiner with respect to claim 12, "claim 12 is clearly met." Applicants disagree, and submit that there is no mention or suggestion in the references cited by the Examiner of first treating a preform comprised of consolidated glass and soot deposit over the consolidated glass with deuterium, followed by consolidation of the silica soot on the outside of the gas. Merely stating that a claim is "clearly met" is not sufficient to establish a prima facie case of obviousness.

Claims 13 and 14

With respect to claims 13 and 14, according to the Examiner:

> "Gilliand teaches repeating the steps of deposition and elongation. Alternatively: Examiner takes Official Notice that Corning Inc. has numerous patents involving the repetition of depositing of soot on a consolidated perform – for various advantages. And such is well known to one of ordinary skill. It would have been obvious to apply the repetitions as claimed to the prior art combination, for the advantages disclosed in any of the various Corning Patents."

While Gilliland may teach repeating steps of deposition and elongation, there is no mention or suggestion in Gilliland of depositing additional layers of soot and than exposing the additional layer to deuterium. There is no mention or suggestion in Gilliland of depositing soot onto a consolidated glass body, exposing that soot and glass body to deuterium, following by additional consolidation and deposition of additional soot, after which another deuterium exposure step is provided. The Examiner states that repeating depositions steps are known in the art, and that it would be obvious to apply repetitions for the advantage that is disclosed in any of the various Corning patents. It is impossible to respond to this rejection without knowing what advantages the Examiner is referring to, and whether those advantages would apply to the process defined by claims 13 and 14. It is perhaps for this reason that the MPEP indicates that Official Notice should be rare when an application is under Final Rejection. Applicants submit that, in view of the above comments, The Examiner has failed to make out a prima facie case of obviousness, and that claims 13 and 14 are in condition for allowance.

Claim 17

With respect to claim 17, the Patent Office indicated that "Claim 17 is met 0% of the compound is formed by the reaction: 100% of the compound is presumed to have been fabricated prior to the process." Applicants respectfully do not understand the Examiner's comment nor which portion of Gilliland or Burrus the Examiner is referring to. Applicants submit that claim 17 is clearly in condition for allowance, as neither Gilliland nor Burrus disclose a method that results in less than 0.1 ppm OD being formed in the consolidated glass perform at all radii less than about one fourth the outer radius of the consolidated glass body.

The rejection of Claims 4-11 and 16 under 35 U.S.C §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is improper.

According to the Patent Office, "claims 4, 6 and 8 have a group which is very similar to the above accepted form, but there is no indication that the group is "consisting of" the members." Therefore it is impossible for anyone to tell if applicant's group is open or closed to additional members – and thus the claim presents uncertainty or ambiguity with respect to the question of scope of the claim.

Applicants respectfully disagree. There is no requirement that a Markush group must include the words "consisting essentially of". Contrary to the Examiner's assertions, claim 4 does not refer to a "group which comprises" a number of members. The word "group" in fact does not occur at all in claim 4. Instead, claim 4 requires an atmosphere comprising one or more of Cl_2, CCl_2, $SOCl_2$, $SiCl_4$, $GeCl_4$, and $POCl_3$. Applicants submit that this language is clear, in that the atmosphere must comprise one or more of the listed ingredients. Because "comprising" is open ended, it is clear that the atmosphere could include other ingredients as well..

According to the MPEP:

"When materials recited in a claim are so related as to constitute a proper Markush group, they may be recited in the conventional manner, or alternatively. For example, if "wherein R is a material selected from the group consisting of A, B, C and D" is a proper limitation, then "wherein R is A, B, C or D" shall also be considered proper."

With respect to claim 16, the Patent Office indicated that "there is no antecedent basis for "the concentration of any OD present in the consolidated...." Moreover, it is not understood what is meant by this."

Applicants disagree that the meaning of this passage in claim 16 is unclear, and also disagree that there is lack of antecedent basis. Inherent components of elements recited have antecedent basis in the recitation of the components themselves. For example, the limitation "the outer surface of said sphere" would not require an antecedent recitation that the sphere has an outer surface. MPEP-2173.05(e). Similarly "the concentration of OD" has inherent antecedent basis. The meaning of the passage is quite simple, the concentration of any OD present in the consolidated perform at all ratios less than about 0.25 times the outer radius of the consolidated glass body is less than 0.1 ppm.

Conclusion

In conclusion, Appellants request a reversal of each of the grounds of rejection maintained by the Examiner and prompt allowance of the pending claims 1-14 and 16-19.

Please charge the fees due under 37 C.F.R. § 1.17(c) to Deposit Account No. 03-3325. If there are any other fees due in connection with the filing of this Brief on Appeal, please charge the fees to our Deposit Account No. 03-3325. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

Dated: October 9, 2007

By: 

Robert L. Carlson
Registration No. 35,473
607-974-3502
Corning Incorporated
Patent Department
SP-TI-03-01
Corning, NY 14831

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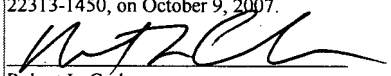

Robert L. Carlson

VIII. CLAIMS APPENDIX

The claims on appeal are as follows:

1. **(Rejected)** A method of forming an optical fiber preform, the method comprising::

providing a consolidated glass preform precursor body having an outer surface;

depositing a layer of silica soot onto the outer surface of the consolidated glass preform precursor body to form a composite preform comprised of a consolidated glass portion and a silica soot portion; and

in a deuterium-exposing step, exposing the composite preform to an atmosphere containing a concentration of D_2 or D_2O or a mixture of D_2 or D_2O for a time and at a temperature sufficient to cause the D_2 or D_2O to penetrate the consolidated glass portion without entirely pervading the consolidated glass portion.

2. **(Rejected)** The method of Claim 1 wherein the depositing step further comprises forming a hydroxyl species in the consolidated glass preform precursor body.

3. **(Rejected)** The method of Claim 2 wherein at least a portion of the hydroxyl species in the consolidated glass preform precursor body is exchanged with at least a portion of the D_2 or D_2O in the consolidated glass portion to form OD in the consolidated glass portion.

4. **(Rejected)** The method of Claim 1 further comprising, after the depositing step, exposing the composite preform to a dehydration atmosphere comprising one or more of Cl_2, CCl_2, $SOCl_2$, $SiCl_4$, $GeCl_4$, and $POCl_3$.

5. **(Rejected)** The method of Claim 4 wherein the dehydration atmosphere further comprises an inert gas.

6. **(Rejected)** The method of Claim 1 wherein, the composite preform is exposed to a dehydration atmosphere prior to the deuterium-exposing step, wherein the dehydration atmosphere comprises one or more of Cl_2, CCl_2, $SOCl_2$, $SiCl_4$, $GeCl_4$, and $POCl_3$.

7. **(Rejected)** The method of Claim 4 wherein the composite preform is exposed to a purge

atmosphere comprising an inert gas prior to the deuterium-exposing step.

8. **(Rejected)** The method of Claim 4 wherein the composite preform is exposed to a dehydration atmosphere comprising one or more of Cl_2, CCl_2, $SOCl_2$, $SiCl_4$, $GeCl_4$, and $POCl_3$, and then the composite preform is exposed to a purge atmosphere comprising an inert gas, prior to the deuterium-exposing step.

9. **(Rejected)** The method of Claim 4 wherein the composite preform is exposed to a purge atmosphere comprising an inert gas after the deuterium-exposing step.

10. **(Rejected)** The method of Claim 4 wherein the composite preform is exposed to the dehydration atmosphere after the deuterium-exposing step.

11. **(Rejected)** The method of Claim 4 wherein, after the deuterium-exposing step, the composite preform is exposed to a purge atmosphere comprising an inert gas, and then the composite preform is exposed to the dehydration atmosphere.

12. **(Rejected)** The method of Claim 1 further comprising consolidating the silica soot portion to form a second glass portion whereby the composite preform is transformed into a second consolidated glass preform precursor body.

13. **(Rejected)** The method of Claim 12 further comprising depositing an additional layer of silica soot onto the second consolidated glass preform precursor body to form a second composite preform and then exposing the second composite preform to D_2 or D_2O.

14. **(Rejected)** The method of Claim 13 further comprising heating and drawing the second consolidated glass preform precursor body to a reduced diameter prior to depositing the additional layer of silica soot thereon.

15. **(Canceled)**

16. **(Rejected)** The method of Claim 1 wherein the consolidated glass preform precursor body is generally cylindrical about a centerline axis, wherein at least a portion of the consolidated glass preform precursor body extends to an outer radius RC1 measured from the centerline axis, and wherein the concentration of any OD present in the consolidated glass preform precursor body at all radii less than about 0.25 RC1 is less than 0.1 ppm.

17. **(Rejected)** The method of Claim 2 wherein less than 0.1 ppm OD is formed in the consolidated glass portion at all radii less than about one-fourth the outer radius of the consolidated glass preform precursor body.

18. **(Rejected)** The method of Claim 16 wherein the OD concentration at all radii less than about 0.5 RC1 is less than 0.1 ppm.

19. **(Rejected)** The method of Claim 16 wherein the OD concentration at all radii less than about 0.75 RC1 is less than 0.1 ppm.

20. **(Canceled)**

IX. EVIDENCE APPENDIX

None

X. RELATED PROCEEDINGS APPENDIX

None